

REMARKS

Claims 112-141, 151-168, 185-216 and 226-243 are currently pending in the application. The foregoing separate sheets marked as "Listing of Claims" show all the claims in the application, with an indication of the current status of each.

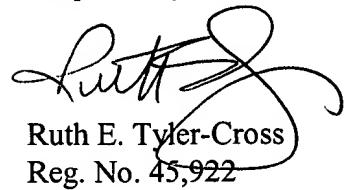
Applicant thanks Examiner for the indication in the Office Action dated 10/15/2004 that all claims in the application are allowed. Further to Examiner's comments in that Office Action, Applicant has hereby amended the specification by replacing the first paragraph of the specification with a replacement paragraph that recites that the parent application of the present application is now abandoned and is no longer copending.

Further, Applicant herewith submits a corrected Sequence Listing for the application in which the sequences on page 89 and the sequences on page 69 are listed as SEQ ID NOS: 15 and 16 and SEQ ID NOS: 17 and 18 , respectively. In addition, the specification has been amended in order to replace the two paragraphs that contain the sequences, paragraph [0380] on page 89 and paragraph [0329] on page 69, with replacement paragraphs that contain the SEQ ID NOS. Applicant submits that these amendments to the specification do not introduce any new matter, and requests entry of the replacement paragraphs. Applicant notes that the original paragraph [0380] contained underlining in the text within the sequence (the first 23 nucleotides) to indicate the T7 promoter sequence. This underlining has been retained in order to remain true to the original text, and should not be mistaken for new text, even though the new SEQ ID NOS. are also underlined to show that they are being added.

In view of the foregoing, Applicant submits that the application is now in *prima facie* condition for allowance. Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at 703-787-9400 (fax: 703-787-7557; email: ruth@wcc-ip.com) to discuss any other changes deemed necessary in a telephonic or personal interview.

If an extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



Ruth E. Tyler-Cross
Reg. No. 45,922

Whitham, Curtis & Christofferson, P.C.
11491 Sunset Hills Road, Suite 340
Reston, VA 20190
703-787-9400
703-787-7557 (fax)



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of Betenbaugh et al.

Serial number: 09/930,440

Group Art Unit: 1652

Attorney Docket Number: 03940077pa

Examiner: Rao

Filed: 2001-08-16

For: "**ENGINEERING INTRACELLULAR SIALYLATION PATHWAYS**"

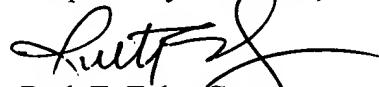
SUBMISSION OF SUBSTITUTE SEQUENCE LISTING AND STATEMENT TO SUPPORT
FILING IN ACCORDANCE WITH 37 C.F.R. § 1.821-1.825

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to an Office Action mailed 10/15/2004, we enclose herein a corrected substitute computer readable form (diskette) and a corrected substitute paper copy of the sequence listings for the above-identified patent application. Please replace the Sequence Listing of the application with this substitute Sequence Listing. Also enclosed is a verified statement that the content of the paper and computer readable copies are the same and include no new matter.

Respectfully submitted,


Ruth E. Tyler Cross
Registration No. 45,922

Whitham, Curtis & Christofferson
11491 Sunset Hills Road; Suite 340
Reston, VA 20190
703-787-9400



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of Betenbaugh et al.

Serial number: 09/930,440

Attorney Docket Number: 03940077pa

Filed: 2001-08-16

For: "**ENGINEERING INTRACELLULAR SIALYLATION PATHWAYS**"

STATEMENT TO SUPPORT FILING AND SUBMISSION IN ACCORDANCE WITH

37 C.F.R. §§ 1.821-1.825

Assistant Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450
Mail Stop SEQUENCE

Dear Sir:

In connection with a Substitute Sequence Listing submitted concurrently herewith, the undersigned states that:

1. the submission, filed herewith in accordance with 37 C.F.R. § 1.821 (g), does not include new matter;
2. the content of the attached paper copy and the attached computer readable copy of the Sequence Listing, submitted in accordance with 37 C.F.R. § 1.821(c) and (e), respectively, are the same; and
3. all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that

such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

Respectfully submitted,



Ruth E. Tyler-Cross

Reg. No. 45,922

12/09/04

Date



Sequence Listing.ST25.txt
SEQUENCE LISTING

<110> Betenbaugh, Michael J.
Lawrence, Shawn J.
Lee, Yuan C.
Coleman, Timothy A.

<120> Engineering Intracellular Sialylation Pathways

<130> 03940077pa

<140> 09/930,440

<141> 2001-08-16

<150> US 60/122,582

<151> 1999-03-02

<150> US 60/169,624

<151> 1999-12-08

<150> US 60/227,579

<151> 2000-08-25

<150> US 09/516,793

<151> 2000-03-01

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tccagagatt tatcaacttt gttgtcaaac taggtttgg agtgtcacag accaaagcca 720
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Sequence Listing.ST25.txt

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Tyr Val Asp Tyr Leu Val Lys Glu Gln Gly Val Lys Asn Ile Phe Val
35 40 45

Asn Gly Thr Thr Gly Glu Gly Leu Ser Leu Ser Val Ser Glu Arg Arg
50 55 60

Gln Val Ala Glu Glu Trp Val Thr Lys Gly Lys Asp Lys Leu Asp Gln
65 70 75 80

Val Ile Ile His Val Gly Ala Leu Ser Leu Lys Glu Ser Gln Glu Leu
85 90 95

Ala Gln His Ala Ala Glu Ile Gly Ala Asp Gly Ile Ala Val Ile Ala
100 105 110

Pro Phe Phe Leu Lys Pro Trp Thr Lys Asp Ile Leu Ile Asn Phe Leu
115 120 125

Lys Glu Val Ala Ala Ala Pro Ala Leu Pro Phe Tyr Tyr Tyr His
130 135 140

Sequence Listing.ST25.txt

Ile Pro Ala Leu Thr Gly Val Lys Ile Arg Ala Glu Glu Leu Leu Asp
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Gly Ile Leu Asp Lys Ile Pro Thr Phe Gln Gly Leu Lys Phe Ser Asp
165 170 175

Thr Asp Leu Leu Asp Phe Gly Gln Cys Val Asp Gln Asn Arg Gln Gln
180 185 190

Gln Phe Ala Phe Leu Phe Gly Val Asp Glu Gln Leu Leu Ser Ala Leu
195 200 205

Val Met Gly Ala Thr Gly Ala Val Gly Ser Phe Val Ser Arg Asp Leu
210 215 220

Ser Thr Leu Leu Ser Asn Val Leu Glu Cys His Arg Pro Lys Pro Ser
225 230 235 240

Leu Trp Ser Leu Gly Phe Gln Trp Ala His Pro Gly Phe His Cys Arg
245 250 255

Lys Pro Pro Gly Ser Leu Leu Ile Val Leu Lys Leu Asn Arg Ala Trp
260 265 270

Ile Ser Phe Leu Ser Leu Ile Arg Met Glu Thr Trp Lys Leu Val Ala
275 280 285

Ser Ala Ser Leu Ser Asn Gln Gly Phe Ala Pro Leu Arg His Asn Leu
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<212> DNA

<213> Homo sapiens

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aagaacatta agcacctggc ggggtcccg ctcattggct gggtcctgcg tgcggccctg 240

gattcagggg ctttccagag tgtatgggtt tcgacagacc atgatgaaat tgagaatgtg 300

gccaaacaat ttggtgacaca agttcatcga agaagttctg aagtttcaaa agacagctct 360

acctcaactag atgccatcat agaatttctt aattatyata atgaggktga cattgttaga 420

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Sequence Listing.ST25.txt

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Page 4

Sequence Listing.ST25.txt

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25

30

Gly Gly Gln Gly Arg Gly Val Glu Lys Pro Pro His Leu Ala Ala Leu
35 40 45

Ile Leu Ala Arg Gly Gly Ser Lys Gly Ile Pro Leu Lys Asn Ile Lys
50 55 60

His Leu Ala Gly Val Pro Leu Ile Gly Trp Val Leu Arg Ala Ala Leu
65 70 75 80

Asp Ser Gly Ala Phe Gln Ser Val Trp Val Ser Thr Asp His Asp Glu
85 90 95

Ile Glu Asn Val Ala Lys Gln Phe Gly Ala Gln Val His Arg Arg Ser
100 105 110

Ser Glu Val Ser Lys Asp Ser Ser Thr Ser Leu Asp Ala Ile Ile Glu
115 120 125

Phe Leu Asn Tyr Xaa Asn Glu Xaa Asp Ile Val Gly Asn Ile Gln Ala
130 135 140

Thr Ser Xaa Cys Leu His Pro Thr Asp Leu Gln Lys Val Ala Glu Met
145 150 155 160

Ile Arg Glu Glu Gly Tyr Asp Ser Xaa Phe Ser Val Val Arg Arg His
165 170 175

Gln Phe Arg Trp Ser Glu Ile Gln Lys Gly Val Arg Glu Val Thr Glu
180 185 190

Pro Leu Asn Leu Asn Pro Ala Lys Arg Pro Arg Arg Gln Asp Trp Asp
195 200 205

Gly Glu Leu Tyr Glu Asn Gly Ser Phe Tyr Phe Ala Lys Arg His Leu
210 215 220

Ile Glu Met Gly Tyr Leu Gln Gly Lys Met Ala Tyr Tyr Glu Met
225 230 235 240

Arg Ala Glu His Ser Val Asp Ile Asp Val Asp Ile Asp Trp Pro Ile
245 250 255

Ala Glu Gln Arg Val Leu Arg Tyr Gly Tyr Phe Gly Lys Glu Lys Leu
260 265 270

Sequence Listing ST25.txt

Lys Glu Ile Lys Leu Leu Val Cys Asn Ile Asp Gly Cys Leu Thr Asn
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Gly His Ile Tyr Val Ser Gly Asp Gln Lys Glu Ile Ile Ser Tyr Asp
290 295 300

Val Lys Asp Ala Ile Gly Ile Ser Leu Leu Lys Lys Ser Gly Ile Glu
305 310 315 320

Val Arg Leu Ile Ser Glu Arg Ala Cys Ser Lys Gln Thr Leu Ser Ser
325 330 335

Leu Lys Leu Asp Cys Lys Met Glu Val Ser Val Ser Asp Lys Leu Ala
340 345 350

Val Val Asp Glu Trp Arg Lys Glu Met Gly Leu Cys Trp Lys Glu Val
355 360 365

Ala Tyr Leu Gly Asn Glu Val Ser Asp Glu Glu Cys Leu Lys Arg Val
370 375 380

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420

Sequence Listing.ST25.txt

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<213> Homo sapiens

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35 40 45

Asp Cys Ala Lys Phe Gln Lys Ser Glu Leu Glu Phe Lys Phe Asn Arg
50 55 60

Lys Ala Leu Glu Arg Pro Tyr Thr Ser Lys His Ser Trp Gly Lys Thr
65 70 75 80

Tyr Gly Glu His Lys Arg His Leu Glu Phe Ser His Asp Gln Tyr Arg
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Glu Leu Gln Arg Tyr Ala Glu Glu Val Gly Ile Phe Phe Thr Ala Ser
100 105 110

Gly Met Asp Glu Met Ala Val Glu Phe Leu His Glu Leu Asn Val Pro
115 120 125

Sequence Listing.ST25.txt

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Lys Thr Ala Lys Lys Gly Arg Pro Met Val Ile Ser Ser Gly Met Gln
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Ser Met Asp Thr Met Lys Gln Val Tyr Gln Ile Val Lys Pro Leu Asn
165 170 175

Pro Asn Phe Cys Phe Leu Gln Cys Thr Ser Ala Tyr Pro Leu Gln Pro
180 185 190

Glu Asp Val Asn Leu Arg Val Ile Ser Glu Tyr Gln Lys Leu Phe Pro
195 200 205

Asp Ile Pro Ile Gly Tyr Ser Gly His Glu Thr Gly Ile Ala Ile Ser
210 215 220

Val Ala Ala Val Ala Leu Gly Ala Lys Val Leu Glu Arg His Ile Thr
225 230 235 240

Leu Asp Lys Thr Trp Lys Gly Ser Asp His Ser Ala Ser Leu Glu Pro
245 250 255

Gly Glu Leu Ala Glu Leu Val Arg Ser Val Arg Leu Val Glu Arg Ala
260 265 270

Leu Gly Ser Pro Thr Lys Gln Leu Leu Pro Cys Glu Met Ala Cys Asn
275 280 285

Glu Lys Leu Gly Lys Ser Val Val Ala Lys Val Lys Ile Pro Glu Gly
290 295 300

Thr Ile Leu Thr Met Asp Met Leu Thr Val Lys Val Gly Glu Pro Lys
305 310 315 320

Ala Tyr Pro Pro Glu Asp Ile Phe Asn Leu Val Gly Lys Lys Val Leu
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Sequence Listing.ST25.txt

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Val Asn Ala Val Lys Phe Gln Thr Phe Lys Ala Asp Lys Leu Ile Ser
35 40 45

Ala Ile Ala Pro Lys Ala Glu Tyr Gln Ile Lys Asn Thr Gly Glu Leu
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Sequence Listing.ST25.txt

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Tyr Leu His Leu Met Glu Tyr Ala Val Ser Leu Asn Leu Asp Val Phe
85 90 95

Ser Thr Pro Phe Asp Glu Asp Ser Ile Asp Phe Leu Ala Ser Leu Lys
100 105 110

Gln Lys Ile Trp Lys Ile Pro Ser Gly Glu Leu Leu Asn Leu Pro Tyr
115 120 125

Leu Glu Lys Ile Ala Lys Leu Pro Ile Pro Asp Lys Lys Ile Ile Ile
130 135 140

Ser Thr Gly Met Ala Thr Ile Asp Glu Ile Lys Gln Ser Val Ser Ile
145 150 155 160

Phe Ile Asn Asn Lys Val Pro Val Gly Asn Ile Thr Ile Leu His Cys
165 170 175

Asn Thr Glu Tyr Pro Thr Pro Phe Glu Asp Val Asn Leu Asn Ala Ile
180 185 190

Asn Asp Leu Lys Lys His Phe Pro Lys Asn Asn Ile Gly Phe Ser Asp
195 200 205

His Ser Ser Gly Phe Tyr Ala Ala Ile Ala Ala Val Pro Tyr Gly Ile
210 215 220

Thr Phe Ile Glu Lys His Phe Thr Leu Asp Lys Ser Met Ser Gly Pro
225 230 235 240

Asp His Leu Ala Ser Ile Glu Pro Asp Glu Leu Lys His Leu Cys Ile
245 250 255

Gly Val Arg Cys Val Glu Lys Ser Leu Gly Ser Asn Ser Lys Val Val
260 265 270

Thr Ala Ser Glu Arg Lys Asn Lys Ile Val Ala Arg Lys Ser Ile Ile
275 280 285

Ala Lys Thr Glu Ile Lys Lys Gly Glu Val Phe Ser Glu Lys Asn Ile
290 295 300

Thr Thr Lys Arg Pro Gly Asn Gly Ile Ser Pro Met Glu Trp Tyr Asn
305 310 315 320

Sequence Listing.ST25.txt

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Ile His Ser Glu Phe Lys Asn Gln Gly Glu
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Sequence Listing.ST25.txt

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<223> n = a or t

<220>
<221> misc_feature
<222> (6)..(6)
<223> n = a,c or t

<220>
<221> misc_feature
<222> (9)..(9)
<223> n = c or t

<220>
<221> misc_feature
<222> (10)..(10)
<223> n = i

<220>
<221> misc_feature
<222> (11)..(11)
<223> n = i

<220>
<221> misc_feature
<222> (12)..(12)
<223> n = i

<220>
<221> misc_feature
<222> (15)..(15)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<222> (17)..(17)
<223> n = g or c

<220>
<221> misc_feature
<222> (18)..(18)
<223> n = i

<400> 10
ganntngann nnccngnnca

<210> 11
<211> 20
<212> DNA
<213> Artificial

Sequence Listing.ST25.txt

```
<220>
<223> synthetic oligonucleotide primer
      T,G,I,C/G,C,I,G,G,I,I,I,G/A,T,C,T/G/A,A,T/A,C/T,T,C

<220>
<221> misc_feature
<222> (3)..(3)
<223> n = i

<220>
<221> misc_feature
<222> (4)..(4)
<223> n = c or g

<220>
<221> misc_feature
<222> (6)..(6)
<223> n = i

<220>
<221> misc_feature
<222> (9)..(9)
<223> n = i

<220>
<221> misc_feature
<222> (10)..(10)
<223> n = i

<220>
<221> misc_feature
<222> (11)..(11)
<223> n = i

<220>
<221> misc_feature
<222> (12)..(12)
<223> n = g or a

<220>
<221> misc_feature
<222> (15)..(25)
<223> n = t, g or a

<220>
<221> misc_feature
<222> (17)..(17)
<223> n = t or a

<220>
<221> misc_feature
<222> (18)..(18)
<223> n = c or t

<400> 11
tgnncngnn nntcnanntc
```

20

```
<210> 12
<211> 20
<212> DNA
```

Sequence Listing.ST25.txt

<213> Artificial
<220>
<223> synthetic oligonucleotide primer A, C/A/G, C/T,
T,C,G/A,T,C,I,C,C,I,I,I,G/A,T,G

<220>
<221> misc_feature
<222> (2)..(2)
<223> n = c, a or g

<220>
<221> misc_feature
<222> (3)..(3)
<223> n = c or t

<220>
<221> misc_feature
<222> (6)..(6)
<223> n = g or a

<220>
<221> misc_feature
<222> (9)..(9)
<223> n = i

<220>
<221> misc_feature
<222> (12)..(12)
<223> n = i

<220>
<221> misc_feature
<222> (15)..(15)
<223> n = i

<220>
<221> misc_feature
<222> (16)..(16)
<223> n = i

<220>
<221> misc_feature
<222> (17)..(17)
<223> n = i

<220>
<221> misc_feature
<222> (18)..(18)
<223> n = g or a

<400> 12
anntcntcnc cnccnnnntg

20

<210> 13
<211> 54
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

Sequence Listing.ST25.txt

<400> 13
tgtaatacga ctcactatag ggcggatccg ccatcatgcc gctggagctg gaga 54

<210> 14
<211> 34
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

<400> 14
gtacggtacc ttattaagac ttgattttt tgcc 34

<210> 15
<211> 54
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

<400> 15
tgtaatacga ctcactatag ggcggatccg ccatcatgga ctcggtgag aagg 54

<210> 16
<211> 44
<212> DNA
<213> Artificial

<220>
<223> synthetic oligonucleotide primer

<400> 16
gtacggtacc ttactatTTT tggcatgaat tattaacttt ttcc 44

<210> 17
<211> 14
<212> PRT
<213> Escherichia coli

<400> 17

Ile Ile Ala Ile Ile Pro Ala Arg Ser Gly Ser Lys Gly Leu
1 5 10

<210> 18
<211> 14
<212> PRT
<213> Homo sapiens

<400> 18

Leu Ala Ala Leu Ile Leu Ala Arg Gly Gly Ser Lys Gly Ile
1 5 10